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PUERTO RICO EXPERIMENT STATION

of the

UNITED STATES DEPARTMENT OF AGRICULTURE

MAYAGUEZ, PUERTO RICO

CIRCULAR No. 22

**AN ANNOTATED CHECK LIST OF THE
PARASITES OF ANIMALS IN
PUERTO RICO**

By

H. L. VAN VOLKENBERG

Parasitologist



Issued January 1939



UNITED STATES DEPARTMENT OF AGRICULTURE

OFFICE OF EXPERIMENT STATIONS

PUERTO RICO EXPERIMENT STATION

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By H. L. VAN VOLKENBERG, *parasitologist*¹

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INTRODUCTION

The parasites of animals established in Puerto Rico, some 200 species, are also, with but few exceptions, found on the continent of North America. However, owing to differences in climatic and other factors there is considerable variation in the abundance of different species in the island as compared with the same species on the continent. As all the species of mammals now existing in Puerto Rico, except bats, have been introduced there are no native species of fixed parasites in them.

The eradication campaign now under way against the cattle tick will alter the incidence, at least temporarily, of several of the external parasites attacking cattle, horses, and goats; it is possible that in addition to the cattle tick, some of these species also may be eradicated.

As indicated, most of the parasites have been submitted to a specialist either for a specific determination or for verification. A few forms recognized as distinct and established species require further study for a specific identification.

Many of these parasites have been reported previously in several publications, but this is the first attempt to bring them together in one group. Owing to changes in nomenclature several of these parasites have been reported under names different from those found here.

¹ Resigned effective December 15, 1937.

A bibliography of the literature concerning the parasites of animals in Puerto Rico is given at the end of this report. The references are listed in chronological order.

ARTHROPODA

ARACHNIDA

THE PARASITIC MITES

Otodectes cynotis Hering:

THE EAR MITE. Ear mange of the dog and cat is unimportant in comparison with the disease on the continent.

Notoedres cati (Hering):

Det. H. E. Ewing.

THE HEAD MANGE MITE OF THE CAT. This form of mange is common in the cat.

Psoroptes bovis (Gerlach):

Det. H. E. Ewing.

THE SCAB MITE OF CATTLE. Infrequent in cattle.

Psoroptes equi (Hering):

Det. H. E. Ewing.

THE PSOROPTES OF THE HORSE. Psoroptic mange of the horse, common especially in the southern coastal plain and mountain regions.

Psoroptes cuniculi (Delafond):

Det. H. E. Ewing.

EAR MITE OF THE RABBIT. Collected at Mayaguez.

Sarcoptes equi Gerlach:

EQUINE SARCOPTIC MANGE MITE. Rare in the horse.

Sarcoptes suis Gerlach:

Det. H. E. Ewing.

THE SARCOPTIC MANGE MITE OF SWINE. The mite is common but the mange unimportant.

Sarcoptes canis Gerlach:

CANINE SARCOPTIC MANGE MITE. Common.

Demodex canis Leydig:

THE DOG FOLLICLE MITE. Apparently rare in the dog.

Demodex phylloides Csokar:

Det. H. E. Ewing.

THE SWINE FOLLICLE MITE. The mite is frequently encountered in slaughtered hogs but the mange is unimportant.

Demodex bovis Stiles:

Apparently rare in cattle.

Liponyssus bursa (Berlese):

Det. H. E. Ewing.

THE TROPICAL FOWL MITE. Common.

Cytolichus nudus (Vizioli):

Det. H. E. Ewing.

THE AIR SAC MITE. Collected at Mayaguez.

Trombicula tropica Ewing:

Det. H. E. Ewing.

THE TROPICAL HARVEST MITE. The larvae of this mite is found frequently on the horse. Also occurs on the chicken and goat.

Megninia cubitalis Megnin and *Epidermoptes* sp.:

Det. H. E. Ewing.

FEATHER MITES. Apparently common on the chicken.

THE IXODOIDEA, OR TICKS

Boophilus annulatus australis (Fuller):

Det. F. C. Bishopp.

THE TROPICAL CATTLE TICK. Very common and abundant on cattle. Also occurs on the horse, goat, and sheep. H. D. Tate has collected this tick from the dog, once at Mayaguez and once at Manati. Stuart Danforth took several specimens from the stomach of a grackle at Guane Libre, Cuba, July 5, 1933.

Dermacentor nitens Neumann:

Det. H. O. Schroeder.

THE TROPICAL HORSE TICK. Very common on the horse especially in the southern coastal plain and mountain regions. This species has been collected from the goat, pig, and cattle at Mayaguez. H. D. Tate collected specimens from sheep.

Rhipicephalus sanguineus Latreille:

Det. H. O. Schroeder.

THE BROWN DOG TICK. Common on dog. This species collected from ear of goat at Mayaguez. The common house lizard of Puerto Rico preys voraciously on this tick.

- Amblyomma cruciferum* Neumann: Det. Allen McIntosh.
Collected by H. D. Tate from the rock iguana, *Cyclura cornuta* of Mona Island,
P. R. Specimens included seven males and one female.

HEXAPODA

THE MALLOPHAGA, OR BITING LICE

- Heterodoxus longitarsus* Piaget: Det. H. E. Ewing.
THE KANGAROO LOUSE. Infrequent on dog.
- Gyropus ovalis* Nitzsch: Det. W. A. Hoffman.
Collected by W. A. Hoffman from guinea pig at San Juan.
- Gliricola porcelli* (Linnaeus): Det. W. A. Hoffman.
Collected by W. A. Hoffman from guinea pig at San Juan.
- Menopon gallinae* (Linnaeus): Det. H. S. Peters.
THE SHAFT LOUSE. Common on chicken.
- Menopon numidia* Giebel: Det. W. A. Hoffman.
Collected by W. A. Hoffman from guinea fowl at Guaynabo.
- Eomenacanthus stramineus* (Nitzsch): Det. W. A. Hoffman.
THE BODY LOUSE. Probably the most common louse on chicken. It was
also taken from turkey.
- Menacanthus* sp.: Det. H. S. Peters.
Infrequent on chicken.
- Colpocephalum* sp.: Det. H. S. Peters.
Common on turkey.
- Bovicola caprae* Gurlt: Det. H. S. Peters.
THE BITING LICE OF GOATS. Common on goats.
- Felicola subrostrata* (Nitzsch): Det. H. S. Peters.
THE CAT LOUSE. Rare on cat.
- Goniodes meleagridis* (Linnaeus): Det. H. S. Peters.
THE LARGE TURKEY LOUSE. Common on turkey.
- Goniodes dissimilis* Nitzsch: Det. H. S. Peters.
THE BROWN CHICKEN LOUSE. Common on chicken.
- Goniocotes hologaster* Nitzsch: Det. H. S. Peters.
THE FLUFF LOUSE. Common on chicken.
- Lipeurus caponis* (Linnaeus): Det. H. S. Peters.
THE WING LOUSE. Common on chicken.
- Lipeurus gallipavonis* (Geoffroy): Det. H. S. Peters.
THE SLENDER TURKEY LOUSE. Common on turkey. Occur as strays on chicken.
- Lipeurus numidae* (Denny): Det. W. A. Hoffman.
Collected by W. A. Hoffman from guinea fowl at Guaynabo.

THE ANOPLURA, OR SUCKING LICE

- Haematopinus adventicius* Neumann: Det. H. E. Ewing.
THE HOG LOUSE. Infrequent on confined hogs. Rare on the native pig.
- Haematopinus tuberculatus* Burmeister: Det. H. E. Ewing.
THE SWITCH LOUSE OR BUFFALO LOUSE. Common on cattle.
- Linognathus africanus* Kellogg and Paine: Det. H. E. Ewing.
THE AFRICAN SUCKING LOUSE. Common on goat. Less common than the
biting louse, *Bovicola caprae*.

THE SIPHONAPTERA, OR FLEAS

- Tunga penetrans* (Linnaeus): Det. H. E. Ewing.
THE NIGUA OR SAND FLEA. Common on pigs raised near the seashore.
- Echidnophaga gallinacea* Olliff: Det. F. C. Bishopp.
THE TROPICAL HEN FLEA. Common on chickens. Occasionally serious infesta-
tions occur among young birds.
- Pulex irritans* Linnaeus: Det. H. E. Ewing.
THE HUMAN FLEA. Infrequent on dog and rat.
- Ctenocephalides canis* (Curtis):
THE DOG FLEA. Very common on dog. Also collected from cat and mongoose.

Ctenocephalides felis (Bouché):

Det. M. A. Stewart.

THE CAT FLEA. Common on cat. Heavy infestations have been found several times among confined calves.

THE DIPTERA, OR FLY PESTS

Chrysops variegata DeGeer:

This fly is the most common species of the horseflies, but even so it is not abundant.

Tabanus hookeri Townsend:

Det. Alan Stone.

Collected by H. L. Dozier at Lake Cartagena, November 1935 and at Ensenada July 1936. Wolcott (38) reports several collections of this species.

Lepiselaga crassipes (Fabricius):

Det. Alan Stone.

Collected by Luis Enrique Gregory at San German, February 1936. Also by H. L. Dozier at Lake Guanica, April 1936.

Philornis pici Macquart:

Det. D. G. Hall.

The warble-like larvae are common in the grackle or mozambique, *Holoquiscalus niger brachypterus*, at Mayaguez.

Cochliomyia americana Cushing and Patton:

Det. E. C. Cushing.

THE PRIMARY SCREW WORM FLY. The fly is common and widespread but owing to prompt treatment of wounds, it does not cause much damage to livestock.

Stomoxys calcitrans (Linnaeus):

THE STABLE FLY. Common but not very abundant.

Haematobia irritans (Linnaeus):

THE HORN FLY OR MOSCA DEL GANADO. Common and widespread but not very abundant except in dry southern coastal plain.

Gastrophilus nasalis (Linnaeus):

Det. E. F. Knipling.

THE THROAT BOTFLY. The bots are found in about 50 percent of necropsies on the horse but infestations are mild in character.

Hippelates pusio Loew and *H. Pallipes*:

Det. J. M. Aldrich.

Common on cattle and other animals. Apparently these two species are the most common of the *Hippelates* attracted to cattle and other livestock.

Trichobius dugesii Townsend and *Pterellipsis araneae* Coq.: Det. Alan Stone.

Collected by H. D. Tate from bat near Boqueron.

For species of mosquitoes (Culicidae), blackflies or majes (Simuliidae), the sand flies or plagas (Culicoides), other species of gnats or mimes (Hippelates) and other species of horseflies (Tabanidae) refer to Wolcott (38).

PROTOZOA

SPOROZOA

HAEMOSPORIDIA

Babesia bigemina (Smith and Kilborne, 1893):*Babesia argentina* (Lignières, 1903):

Tick fever common among introduced cattle. Rare among established animals.

Babesia canis (Piana and Galli-Valerio, 1895):

Piroplasmosis infrequent in dog.

Anaplasma marginale Theiler, 1910:

Anaplasmosis common among established cattle of the improved breeds.

Apparently all cattle over 1 year of age introduced from the continent become infected with this disease.

COCCIDIA

Eimeria zurni Rivolta, 1878; *Eimeria smithi* Yakimoff and Galouzo, 1927; *Eimeria ellipsoidalis* Becker and Frye, 1929:

Det. E. A. Allen.

Host—cattle.

Eimeria faurei Moussu and Marotel, 1901; *Eimeria arloingi* Marotel, 1905;

Eimeria nina-kohl-yakimovi Yakimoff and Rastegaieff, 1930:

Host—goat.

Det. J. F. Christensen.

Eimeria tenella (Railliet and Lucet, 1891); *Eimeria acervulina* Tyzzer, 1929;
Eimeria maxima Tyzzer, 1929; *Eimeria mitis* Tyzzer, 1929; *Eimeria necatrix*
 Johnson, 1930; *Eimeria praecox* Johnson, 1930: Det. E. A. Allen.
 Host—chicken.

Eimeria deblickei Douwer, 1921: Det. E. A. Allen.
 Host—pig.

Isospora felis Wenyon, 1923: Det. E. A. Allen.
 Host—cat.

The incidence of each species of coccidia is not known. Zoological coccidiosis is very common in these animals. Clinical coccidiosis is serious in the chicken and is of importance in cattle and the pig.

Trichomonas foetus Reidmüller, 1928: Det. G. Dikmans
 The incidence of this organism in cattle is not known at present.

Histomonas meleagridis (Smith, 1895):
 Turkeys brought from the arid regions of the island and placed in contact with chickens in the wet coastal areas are liable to die from blackhead.

Balantidium coli (Malmsten, 1857):
 This ciliate is common in the pig. Apparently capable of producing fatalities in this animal.

PLATYHELMINTHES

TREMATODA, THE FLUKES

Fasciola hepatica Linnaeus, 1758:
 THE LIVER FLUKE, LINGUA OR CUCARACHA. Common and abundant in cattle in wet coastal areas and mountain regions. Less common in goat and pig. Rare in horse.

Cotylophoron cotylophorum (Fischöeder, 1901): Det. E. W. Price.
 THE STOMACH FLUKE. Very common and abundant in cattle in wet coastal areas and mountain regions. Rare in goat.

Platynosomum concinnum (Braun, 1901): Det. E. W. Price.
 THE CAT LIVER FLUKE. Common in cat.

Postharmostomum gallinum Wittenberg, 1923: Det. E. W. Price.
 THE CECAL FLUKE. Infrequent in the chicken.

Prosthogonimus sp.: Det. G. Dikmans.
 Collected by Dikmans from duck.

Mesocoelium danforthi Hoffman, 1935 (32):
 Collected by Hoffman from intestine of the lizard, *Celestus pleii*.

Ascocotyle megalcephala Price, 1932, and *A. puertoricensis* Price, 1932 (27):
 Collected from *Butorides* sp. at Mayaguez, March 24, 1931.

CESTODA, THE TAPEWORMS

Moniezia expansa (Rudolphi, 1805):
 THE COMMON TAPEWORM OF CATTLE. Common in cattle and goat.

Anoplocephala perfoliata (Goeze, 1782):
 THE PERFOLIATE TAPEWORM OF THE HORSE. Common, light infestations. Heavy infestations have been encountered at San Sebastian.

Diphyllobothrium mansonii (Cobbold, 1882): Det. E. W. Price.
 Common in both dog and cat.

Taenia hydatigena Pallas, 1766: Det. E. W. Price.
 Common in dog and cat.

Cysticercus tenuicollis Rudolphi, 1810:
 Common in goat. Infrequent in cattle and pig.

Taenia taeniaeformis (Batsch, 1786): Det. E. W. Price.
 Common in cat.

Cysticercus fasciolaris Rudolphi, 1808:
 Common in rat and mouse.

Dipylidium caninum (Linnaeus, 1758): Det. E. W. Price.
 Very common in dog. Infrequent in cat.

Cysticercus bovis Cobbold, 1866:
 Very rare in cattle.

Cysticercus cellulosae (Gmelin, 1790):

Common in pig only in a few, small, restricted districts.

Davainea proglottina (Davaine, 1860):

Common in chicken.

Det. M. F. Jones.

Amoebotaenia sphenoides (Railliet, 1892):

Common in chicken.

Det. M. F. Jones.

Hymenolepis cantianiana (Polonio, 1860):

Very common in chicken.

Det. M. F. Jones.

Raillietina tetragona (Molin, 1858):

Common in chicken.

Det. M. F. Jones.

Raillietina sp.

This species, very similar in morphology to *R. tetragona*, is the more common in the chicken.

NEMATHELMINTHES, THE ROUNDWORMS

ASCAROIDEA

Ascaris lumbricoides Linnaeus, 1758:

THE SWINE ASCARID. Common in pig but infestations very mild.

Parascaris equorum (Goeze, 1782):

Infrequent in horse.

Neoascaris vitulorum (Goeze, 1782):

In some of the dairy herds at Mayaguez apparently none of the calves escape infestation. Has not been found in the other herds.

Toxocara canis (Werner, 1782):

Common in dog.

Det. E. W. Price.

Toxocara mystax (Zeder, 1800):

Common in cat.

Det. E. W. Price.

OXYUROIDEA

Heterakis gallinae (Gmelin, 1790):

COMMON CECUM WORM. Common in chicken.

Det. E. B. Cram.

Heterakis brevispiculum Gendre, 1911:

Common in guinea fowl.

Det. E. B. Cram.

Ascaridia galli (Schränk, 1788):

LARGE ROUNDWORM OF INTESTINE. Common in chicken. Infrequent in guinea fowl.

Det. E. B. Cram.

Ascaridia numidae (Leiper, 1908):

Common in guinea fowl.

Det. E. B. Cram.

Subulura strongylina (Rudolphi, 1819):

Common in guinea fowl.

Det. E. B. Cram.

Subulura brumpti (Lopez-Neyra, 1922):

Incidence in turkey not known.

Det. E. B. Cram.

Oxyuris equi (Schränk, 1788):

THE PIN WORM OF THE HORSE. Infrequent in equines.

Probstmayria vivipara (Probstmayr, 1865):

Found several times in horse. Incidence not known.

Det. Allen McIntosh.

RHABDITOIDEA

Strongyloides avium Cram, 1929:

Very common and abundant in chicken.

Det. E. B. Cram.

Strongyloides vituli Brumpt, 1921:

Common in calves.

STRONGYLOIDEA

Oesophagostomum dentatum (Rudolphi, 1803):

THE NODULAR WORM OF PIG. Common in pig.

Det. G. Dikmans.

Oesophagostomum quadrispinulatum (Marccone, 1901):

Syn. *O. longicaudum* Goodey, 1925. Common in pig.

Det. G. Dikmans.

Oesophagostomum radiatum (Rudolphi, 1803):

Common in cattle.

Det. G. Dikmans.

Oesophagostomum venulosum (Rudolphi, 1809):

Common in goat.

Oesophagostomum columbianum Curtice, 1890:

Common in goat.

Det. G. Dikmans.

Stephanurus dentatus Diesing, 1839:

THE LARD OR KIDNEY WORM. Common in pig.

Syngamus laryngeus Railliet, 1899:

THE GULLET WORM. Common in goat and infrequent in cattle.

Det. B. H. Ransom.

Strongylus equinus Mueller, 1780; *S. edentatus* (Looss, 1900); *S. vulgaris* (Looss, 1900).

These three species are usually known as the large strongyles of the horse. All three species are common in equines.

Cylicocyclus insigne (Boulenger, 1917); *C. radiatus* (Looss, 1900); *C. nassatus* (Looss, 1900); *C. nassatus* var. *parvus* (Yorke and Macfie, 1918); *C. ashworthi* (Leroux, 1924); *C. auriculatus* (Looss, 1900); *C. elongatus* (Looss, 1900); *Cylicodontophorus ultrajectinus* (Ihle, 1920); *C. bicoronatus* (Looss, 1900); *C. ihlei* (Kotlan, 1921); *C. euproctus* (Boulenger, 1917); *Oesophagodontus robustus* (Giles, 1892); *Cylicocercus goldi* (Boulenger, 1917); *C. calinatum* var. *pseudocatinatum* (Yorke and Macfie, 1919) (Theiler, 1923); *Gyalocephalus capitatus* Looss, 1900; *Cylicostephanus calicatus* (Looss, 1900); *C. minutus* (Yorke and Macfie, 1918); *C. longibursatus* (Yorke and Macfie, 1918); *Cyathostomum coronatum* Looss, 1900; *C. ornatum* (Kotlan, 1919) *C. labratum* Looss, 1900; *C. labiatum* (Looss, 1901); *C. labiatum* var. *digitatum* Ihle, 1921; *Triodontophorus brevicauda* Boulenger, 1916; *T. tenuicollis* Boulenger, 1916; *T. intermedius* Sweet, 1909; *Cylicotetrapedon bidentatum* (Ihle, 1925); *Poteriostomum imparidentatum* Quiel, 1919; *P. ratzii* var. *nanum* Theiler, 1923; *Craterostomum mucronatum* (Ihle, 1920):

Det. Allen McIntosh.

The 30 species in the group above, together with other similar species, are usually known as the small strongyles of equines. No attempt has been made to determine the relative abundance of each species. As a group they are very common and very abundant. Approximately 15,000 of these worms have been taken from a single horse at Mayaguez.

ANCYLOSTOMIDAE, THE HOOKWORMS

Ancylostoma caninum (Ercolani, 1859):

THE COMMON DOG HOOKWORM. Common in dog.

Det. G. Dikmans.

Ancylostoma braziliense (Gomex de Faria, 1910):

Common in cat with light infestations. Also occurs in dog.

Det. B. G. Chitwood.

Necator suillus Ackert and Payne, 1922:

Very rare in pig.

Det. F. K. Payne.

Globocephalus urosulubatus (Alessandrini, 1909):

Common in pig.

Det. G. Dikmans.

Bunostomum phlebotomum (Railliet, 1900):

THE CATTLE HOOKWORM. Common in cattle.

Det. G. Dikmans.

Bunostomum trigonocephalum (Rudolphi, 1808):

THE SHEEP HOOKWORM. Infrequent in the goat.

Det. G. Dikmans.

METASTRONGYLIDAE, THE LUNGWORMS

Metastrongylus elongatus (Dujardin, 1845):

THE COMMON LUNGWORM OF SWINE. Very common in pig.

Choerostongylus pudendotectus (Wostokow, 1905):

THE SHORT-VAGINA LUNGWORM. Very common in pig.

Dictyocaulus viviparus (Bloch, 1782):

LUNGWORM OF CATTLE. Common in cattle.

Dictyocaulus arnfieldi (Cobbold, 1884):

LUNGWORM OF HORSE. Rare in horse.

Muellerius capillaris (Müller, 1889):

THE HAIR LUNGWORM. Common in goat.

Aelurostrongylus abstrusus (Railliet, 1898):

THE CAT LUNGWORM. Common in cat.

Det. E. W. Price.

TRICHOSTRONGYLIDAE

- Trichostrongylus axei* (Cobbold, 1879):
Common in horse, cattle, and goat.
- Trichostrongylus colubriformis* (Giles, 1892):
Common in goat. Det. G. Dikmans.
- Cooperia curticei* (Railliet, 1893):
Collected from sheep. Incidence not known. Det. E. W. Price.
- Cooperia punctata* (Schnyder, 1907):
Common in cattle. Det. G. Dikmans.
- Hyostrongylus rubidus* (Hassall and Stiles, 1892):
THE RED STOMACH WORM OF SWINE. Common in pig. Det. G. Dikmans.
- Ostertagia ostertagi* (Stiles, 1892):
Common in cattle. Det. G. Dikmans.
- Ostertagia circumcincta* (Stadelmann, 1894):
Collected from sheep. Incidence not known. Det. E. W. Price.
- Haemonchus contortus* (Rudolphi, 1803):
THE COMMON STOMACH WORM OF CATTLE. Very common in cattle and goat.
- Haemonchus similis* (Travassos, 1914):
THE TROPICAL STOMACH WORM. Very common in cattle and goats. Actual counts so far have shown this species to be more abundant than *H. contortus*. Det. G. Dikmans.

FILARIIDAE

- Dirofilaria immitis* (Leidy, 1856):
THE HEART WORM. Common in old house dogs.
- Onchocerca gutturosa* Neumann, 1910:
Over 90 percent of cattle slaughtered at Mayaguez were infested with this parasite. Det. B. G. Chitwood.
- Onchocerca cervicalis* Railliet and Henry, 1910:
Less common and abundant in the horse than on the continent.
- Setaria equina* (Abildgaard, 1789):
Infrequent in horse.
- Setaria labiato-papillosa* (Alessandrini, 1838):
Infrequent in cattle.

SPIRURIDAE

- Habronema muscae* (Carter, 1861):
LARGE STOMACH WORM OF HORSE. Rare in horse.
- Habronema microstoma* (Schneider, 1866):
LARGE STOMACH WORM OF HORSE. Infrequent in horse.
- Habronema megastoma* (Rudolphi, 1819):
LARGE STOMACH WORM OF HORSE. Infrequent in horse.
- Ascarops strongylina* (Rudolphi, 1819):
THE STRONGYLINE STOMACH WORM OF SWINE. Common in pig. Det. G. Dikmans.
- Cheilospirura hamulosa* (Diesing, 1851):
THE GIZZARD WORM. Common in chicken. Det. E. B. Cram.
- Dispharynx spiralis* (Molin, 1858):
THE SPIRAL STOMACH WORM. Common in guinea fowl, infrequent in chicken. Det. E. B. Cram.
- Tetrameres americana* Cram, 1927:
THE GLANDULAR STOMACH WORM. Common in chicken. Det. E. B. Cram.
- Tetrameres fissispina* (Diesing, 1861):
Infrequent in chicken. Det. E. B. Cram.
- Physaloptera praeputialis* v. Linstow, 1889:
THE CAT STOMACH WORM. Found in about 10 percent of necropsies on cats in mild infestations. Det. B. G. Chitwood.
- Oxyspirura mansoni* (Cobbold, 1879):
THE EYE WORM. Infrequent in chicken. Det. E. B. Cram.

TRICHINELLIDAE

Trichuris trichiura (Linnaeus, 1771):

THE WHIPWORM. Common in pig.

Trichuris vulpis (Froelich, 1789):

THE DOG WHIPWORM. Common in dog.

Trichuris ovis (Abildgaard, 1795):

THE SHEEP WHIPWORM. Common in goat.

Capillaria brevipes Ransom, 1911:

Common in cattle and goat.

Det. G. Dikmans.

Capillaria plica (Rudolphi, 1819):

THE BLADDER WORM. Common in dog and cat.

Det. E. W. Price.

Capillaria retusa (Railliet, 1893):

Common in chicken.

Det. E. B. Cram.

Capillaria annulata (Molin, 1858):

THE CROP WORM. Common in chicken.

Det. E. B. Cram.

Capillaria columbae (Rudolphi, 1819):

Collected from turkey. Incidence not known.

ACANTHOCEPHALA, THE THORN-HEADED WORMS

Macracanthorhynchus hirudinaceus (Pallas, 1781):

THE THORN-HEADED WORM OF SWINE. Common in pig.

Moniliformis moniliformis (Bremser, 1819):

Common in rat and mouse.

Det. E. W. Price.

Acanthocephala spp.:

These thorn-headed worms are found in about 10 percent of the necropsies of both dogs and cats in mild infestations. E. W. Price who has examined specimens states that they evidently include two distinct species.

EXOTIC PARASITES

Several unestablished species of parasites have been taken from recently introduced animals and apparently a few important parasites have been reported erroneously for Puerto Rico. The species together with comments are listed below.

Boophilus annulatus (Say):

THE NORTH AMERICAN CATTLE TICK. Experts who have recently examined collections of cattle ticks are of the opinion that only the Australian variety (*B. annulatus australis*) is established in Puerto Rico.

Dermacentor variabilis (Say):

Det. H. E. Ewing.

THE WOOD TICK. Several adult females taken by Francisco Seín, November 1929, from an imported horse.

Ornithodoros megnini (Dugès):

THE SPINOSE EAR TICK. Either a mistake was made in the determination of this tick or it has been eradicated by dipping operations against the cattle tick, for so far as known it does not now occur in Puerto Rico.

Haematopinus eurysternus (Nitzsch):

Det. H. E. Ewing.

THE SHORT-NOSED OX LOUSE. According to available records this louse was collected by C. H. Hooker in 1912 from imported cattle, by G. Dikmans in 1926 from native cattle, and by the writer in 1928 also from native cattle. So far as known, the louse has not been encountered since 1928. In the absence of dipping operations against the cattle tick the louse is probably capable of establishing itself in the arid regions of the island.

Cnemidocoptes mutans (Robin and Lanquetin):

THE SCALY LEG MITE. Collected from a recently imported chicken.

Hypoderma spp.:

THE CATTLE GRUBS. The grubs are not uncommon in the backs of imported cattle.

Melophagus ovinus (Linnaeus):

Collected by Van Zwaluwenburg and reported by Wolcott (38, p. 392). Probably this species was taken from imported sheep as it is not known to occur at present.

Trichinella spiralis (Owen, 1835):

So far as known this dangerous parasite is not established.

Chabertia ovina (Fabricius, 1794):

This worm taken from the intestine of a goat recently imported from Indiana.

Uncinaria stenocephala (Railliet, 1884):

Probably taken from a dog recently introduced from the continent.

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